CLAIMS

1. An optical imaging system for irradiating light that emanates from a light source and constructing an observed image of an object according to information of return light received from the object, said optical imaging system comprising:

a replaceable optical probe for propagating the light, which emanates from said light source, to an object, and receiving return light from the object;

a device main body including a light receiving means that receives return light from said light source and object, and converts the light into an electric signal, and having said optical probe freely detachably attached thereto;

a detecting means for detecting the characteristics of an optical probe attached to said main body; and

a designating means for designating the conditions for controlling an optical probe according to the characteristics of the optical probe detected by said detecting means.

2. An optical imaging detection method for irradiating light that emanates from a light source and constructing an observed image of an object according to information of return light received from the object, wherein:

said optical imaging detection method is implemented in an optical imaging system comprising: a replaceable optical probe for propagating light, which emanates from said light

source, to an object and receiving return light from the object; a light receiving means for receiving return light from said light source and object, and converting the light into an electric signal; a main body to which said optical probe can be freely detachably attached; and a detecting means for detecting the characteristics of an optical probe attached to said main body; and

the conditions for controlling an optical probe are designated based on the characteristics of the optical probe detected by said detecting means.

3. An optical probe for propagating light, which emanates from a light source, to an object, and receiving return light from the object, comprising:

memory means in which the characteristics of probes are recorded so that the characteristics of a probe freely detachably attached to a device main body can be read out.

4. The optical imaging system according to Claim 1, further comprising:

at least one scanning means for scanning light that emanates from said light source;

signal generating means for driving said scanning means and generating a timing signal;

storage means on which characteristic information of optical probes is recorded;

an optical system for irradiating light, which emanates

from said light source, to an object, and introducing return light received from the object to said light receiving means;

memory means in which an electric signal sent from said light receiving means is stored;

image signal producing means for transforming data stored in said memory means so as to produce an image signal; and

control means for changing at least one of the settings of said image signal producing means and the settings of said signal generating means according to data read from said memory means.

5. The optical imaging detection method according to Claim 2, comprising:

a reading step for reading data from said storage means;

a calculating step for calculating the conditions for controlling said optical probe according to the data read at said reading step;

a designating step for designating the conditions for control calculated at said calculating step;

a controlling and driving step for controlling and driving said optical probe according to the conditions for control designated at said designating step; and

a displaying-processing step for displaying an image according to image data acquired by an optical probe driven at said controlling and driving step.

6. The optical imaging system according to Claim 4,

wherein said scanning means, said storage means, and at least part of said optical system are included in said optical probe; and said optical probe is freely detachably attached to at least one of said image signal producing means and said signal generating means.

7. The optical imaging system according to Claim 4, wherein said image signal producing means includes an interpolating means.

8. The optical imaging system according to Claim 4, wherein said control means designates data for said signal generating means according to information stored in said storage means.

9. The optical imaging system according to Claim 4, wherein said scanning means is driven at a mechanical resonant frequency.

10. The optical imaging system according to Claim 4, further comprising a gain control means for controlling the sensitivity of said light receiving means to received light.

11. The optical imaging system according to Claim 4, further comprising a filter adjusting means for adjusting the frequency band of an electric signal to be transmitted to said memory means.

12. The optical imaging system according to Claim 4 or 6, wherein the information stored in said storage means includes at least one of a driving frequency at which at least

one scanner is driven, a driving voltage, an offset voltage, and an imaging range.

13. The optical imaging system according to Claim 6, wherein the information stored in said storage means includes at least one of a type of probe and a serial number thereof.

14. The optical imaging system according to Claim 7, wherein said control means designates data for said interpolating means according to information stored in said storage means.

15. The optical imaging system according to Claim 8, wherein the data designated for said signal generating means is the amplitude of a driving waveform with which said scanning means is driven.

16. The optical imaging system according to Claim 8, wherein the data designated for said signal generating means is the frequency of a driving waveform with which said scanning means is driven.

17. The optical imaging system according to Claim 8, wherein the data designated for said signal generating means is the waveform of a driving waveform with which said scanning means is driven.

18. The optical imaging system according to Claim 8, wherein said signal generating means includes a clock generator, and the data designated for said signal generating means is a clock frequency at which a signal is generated by

said clock generator.

19. The optical imaging system according to Claim 8, wherein the data designated for said signal generating means is the timing of a triggering signal outputted to said memory means.

20. The optical imaging system according to Claim 9, wherein two or more scanning means are included, and the beat frequency of the frequencies at which the two or more scanning means are driven is different from a frame rate.

21. The optical imaging system according to Claim 10, wherein said control means designates data for said gain control means according to information stored in said storage means.

22. The optical imaging system according to Claim 10, wherein the data designated for said gain control means is an amount of return light received by said light receiving means.

23. The optical imaging system according to Claim 10, wherein said gain control means includes a gain calculator for calculating a correction value according to the amount of return light.

24. The optical imaging system according to Claim 11, wherein said control means designates data for said filter adjusting means according to information stored in said storage means.

25. The optical imaging system according to Claim 21,

wherein said amount of return light is determined with at least an optical path length relevant to said optical system, a focal length, and a numerical aperture of a lens.

26. The optical imaging system according to Claim 23, wherein said gain control means includes a gain calculator that calculates a correction value according to a luminance value specified in data representing a specific area in at least one frame of an image.

27. The optical imaging system according to Claim 23, wherein said gain control means calculates a luminance value using data representing each frame of an image, and feeds back the luminance value for display of the next frame.

28. The optical imaging system according to Claim 23, wherein said gain control means calculates a luminance value using data representing at least a specific frame, and feeds back the luminance value for display of the next and subsequent frames.

29. The optical imaging system according to Claim 24, wherein the data designated for said filter adjusting means specifies a driving frequency at which said scanning means is driven and a resolution offered by said optical system.